TECHNOLOGY @ ROCKY FLATS

Demonstration & Deployment Summary

Coated tarp material used as transportation package for non-compliant cargo containers

Single-ply, 19-mil coated tarp material is draped over a test container.

Summary

Cargo containers are the packaging containers of choice for low-level radioactive waste because they allow larger items of waste to be disposed of without size-reduction. The Rocky Flats inventory of cargo containers includes more than 900 that do not meet Department of Transportation (DOT) requirements for Strong, Tight Packaging (STP).

Technical leads for Rocky Flats Building 883 developed an innovative solution to dispose of non-compliant cargo containers. Using a single-ply, 19-mil coated tarp material as a “soft side” overpack called the D Unit, the project demonstrated STP equivalency, allowing the containers to be shipped as waste packages. In addition to disposing of the cargo containers, each container can be loaded with low-level radioactive waste.

The Need

More than 900 cargo containers at Rocky Flats have been used for several decades to store radioactive waste, tools, supplies and other equipment. These cargoes, due to age and deterioration, do not meet the DOT requirements for STP. Radioactive surveys, removal of potential internal contamination and disposal of these units would be both costly and time-consuming. Size-reduction efforts are limited by available facilities and schedule. Disposal of the containers as empty vessels is not allowed by the Nevada Test Site (NTS), the DOE low-level waste (LLW) disposal facility. Moreover, to “free-release” the cargoes as contamination-free for sale to the private sector would be cost-prohibitive due to the extensive surveys required.

Developing the Technology

A method was sought which would provide an overpack system by which cargo containers might be effectively packaged, filled with LLW from decommissioning operations and shipped to NTS. The method would provide a practical disposal path for the cargo containers. It would also add an extremely large number of usable waste packaging containers to the site’s inventory without the high cost of procuring additional cargo containers. Additionally, this type of containment was sought as a means by which oversized equipment might be packaged for shipment and disposal without time-consuming and expensive size-reduction work.

A pilot project was initiated and involved 16 damaged cargo containers. A two-part polypropylene/polyethylene material overpack system was designed and fabricated. The system consisted of two dish-style pieces – a 12-inch-deep bottom section and an 8-foot-deep upper section. The two parts are connected by 4-inch Velcro strips, covered by a protective flap and enclosed by a second 4-inch Velcro strip. The package is then secured to a structural platform that allows Rocky Flats and NTS operators to handle the unit. The platform also functions as the base when pieces of equip-

ment are placed into these types of packages. The package was certified to meet the Strong, Tight Package requirements as specified in DOT 173.411.

Development of the "D Unit" Package

The package has evolved into a single-ply, 19-mil (10 ounce) coated tarp material that has received approval for disposal from NTS following successful test shipments on quality STP cargo containers. The project experienced setbacks initially when the first two-ply packages arrived at NTS shredded by high winds and inclement weather. The third test shipment with the improved single-ply package met the expected results of both the project and NTS.

Shipping platforms are used to provide stable support for structurally damaged cargo containers (outside the soft overpack) and for heavy equipment support (inside the overpack). The cargo container is placed onto a structural platform and chained down. The soft-side containment is placed around both the structural platform and the package.

Further adaptations of the package include 1-inch nylon ratchet straps on one end of the package to limit blousing of excess material. Rocky Flats has received approval from NTS, in the form of Waste Profile Modifications, to use this overpack system on Low Specific Activity (LSA) 1 and Surface Contaminated Objects (SCO) 1 materials containing uranium, depleted uranium or plutonium.

The next generation of this type of system will be an integrated unit that incorporates the structural platform and the bottom piece of the soft material. The system will still consist of two pieces, but the platform will become part of the bottom section, reducing the number of pieces that workers have to manage. There is no functional change to the top cover. The next generation will also allow workers to handle the D unit by forklift without using dunnage. The fork pockets will be part of the package, which allows the operator a safer way to manage the unit at the work site and at NTS.

Results and Benefits

Documented savings for the original 16 cargo containers, by avoiding size reduction or other forms of costly disposal alternatives, were in excess of $300,000. Although the package is routinely purchased in a configuration to fit an 8 x 8 ½ x 20-foot cargo, it can be ordered in a number of sizes, including custom sizes to fit various packaging needs. This would allow D Unit material to serve as the packaging container for other large pieces of equipment, avoiding the cost and hazards associated with size reduction. For more information on use of the D Unit at Rocky Flats, call Kent Dorr, Kaiser-Hill Company, (303) 966-6034.

More than 900 cargo containers deteriorated due to age are stored at Rocky Flats.

The overpack consists of two pieces — a 12-inch-deep bottom section and an 8-foot deep upper section

Workers secure the overpack and prepare the demonstration cargo container for shipment.